CLAIMS

1. In a G.709 network of connected integrated circuits, a method for paralleling data streams, the method comprising:

receiving a first digital wrapper data stream having a first data rate;

demultiplexing the first data stream into a second plurality of digital wrapper data streams having a second data rate, less than the first data rate; and,

processing the second plurality of data streams at the second data rate.

2. The method of claim 1 further comprising:

following the processing of the second plurality of data streams, supplying a second plurality of processed data streams having the second data rate;

multiplexing the second plurality of data streams into a first processed data stream having the first data rate; and,

transmitting the first processed data stream.

3. The method of claim 1 wherein receiving a first digital wrapper data stream having a first data rate includes receiving messages in a frame format with overhead bytes; and,

wherein demultiplexing the first data stream into a second plurality of digital wrapper data streams having a second data rate includes supplying a second plurality of messages in a frame format with overhead bytes.

4. The method of claim 3 wherein demultiplexing the first data stream into a second plurality of digital wrapper data streams having a second data rate includes supplying a synchronization signal with each of the second plurality of data streams responsive to overhead bytes in the first data stream; and,

wherein processing the second plurality of data streams at the second rate includes processing each of the second plurality of data streams in response to its corresponding synchronization signal.

5. The method of claim 4 wherein supplying a synchronization signal with each of the second plurality of data streams responsive to overhead bytes in the first data stream includes synchronizing overhead bytes in the second plurality of data streams to overhead bytes in the first data stream.

6. The method of claim 5 wherein receiving messages in a frame format with overhead bytes includes receiving frame alignment signal bytes in the overhead of every frame; and,

wherein synchronizing overhead bytes in the second plurality of data streams to overhead bytes in the first data stream includes synchronizing frame alignment signal bytes in each of the second plurality of data streams to the frame alignment signal bytes in the first data stream.

7. The method of claim 2 wherein supplying a second plurality of processed data streams includes supplying messages in a frame format with overhead bytes; and,

wherein transmitting the first processed data stream includes transmitting messages in a frame format with overhead bytes.

8. The method of claim 7 wherein supplying a second plurality of processed data streams includes supplying a frame start signal with each of the second plurality of processed data streams; and,

wherein multiplexing the second plurality of processed data streams into the first processed data stream includes multiplexing in response to the second plurality of frame start signals.

9. The method of claim 8 wherein multiplexing the second plurality of processed data streams into the first processed data stream includes synchronizing overhead bytes in the first processed data stream to the overhead bytes in the second plurality of processed data streams in response to the frame start signals.

10. The method of claim 9 wherein supplying a second plurality of processed data stream messages in a frame format with overhead bytes includes supplying frame alignment signal bytes in the overhead of every frame; and,

wherein synchronizing overhead bytes in the first processed data stream to overhead bytes in the second plurality of processed data streams includes synchronizing frame alignment signal bytes in the first

processed data stream to frame alignment signal bytes in each of the second plurality of processed data streams.

11. The method of claim 10 further comprising:

following the supplying of the second plurality of processed data streams, comparing each of the second plurality of processed data stream frame start signals;

phase matching the second plurality of frame start signals;

deskewing the second plurality of processed data streams to match their corresponding frame start signals; and,

wherein multiplexing the second plurality of processed data streams into the first processed data stream includes multiplexing the deskewed second plurality of processed data streams.

12. The method of claim 2 wherein demultiplexing the first data stream into a second plurality of digital wrapper data streams includes demultiplexing into four data streams.

13. The method of claim 12 wherein receiving a first digital wrapper data stream having a first data rate includes receiving the first data stream at approximately a 40-gigabits per second data rate; and,

wherein demultiplexing the first data stream into a second plurality of digital wrapper data streams having a second data rate, less than the first data rate, includes demultiplexing the approximately 40-

gigabits per second data stream into 4 data streams having approximately a 10-gigabits per second rate.

14. In a G.709 network of connected integrated circuits, a method for paralleling data streams, the method comprising:

processing a second plurality of data streams at a second rate;

supplying a second plurality of processed data streams having the second data rate;

multiplexing the second plurality of processed data streams into a first processed data stream having the first data rate, greater than the second rate; and,

transmitting the first processed data stream.

15. In a G.709 network of connected integrated circuits, a system for paralleling data streams, the system comprising:

a demultiplexer with an input for receiving a first digital wrapper data stream having a first data rate, the demultiplexer demultiplexing the first data stream into a second plurality of digital wrapper data streams having a second data rate, less than the first data rate, supplied at an output; and,

a second plurality of processors, each processor having an input to accept a corresponding one of the second plurality of data streams and an output to supply a processed data stream at the second data rate.

16. The system of claim 15 further comprising:

a multiplexer having an input to receive the second plurality of processed data streams, the multiplexer multiplexing the second plurality of processed data streams into a first digital wrapper processed data stream having the first data rate, supplied at an output for transmission.

17. The system of claim 16 wherein the demultiplexer receives first data stream messages in a frame format with overhead bytes and supplies the second plurality of data stream messages in a frame format with overhead bytes.

18. The system of claim 17 wherein the demultiplexer has an output to supply a synchronization signal with each of the second plurality of data streams, responsive to overhead bytes in the first data stream; and,

wherein each processor has an input to receive a synchronization signal, each processor processing one of the second plurality of data streams in response to its corresponding synchronization signal.

19. The system of claim 18 wherein the demultiplexer synchronizes overhead bytes in each of the second plurality of data streams to overhead bytes in the first data stream.

20. The system of claim 19 wherein the demultiplexer receives frame alignment signal bytes in the overhead of every first data

stream frame and synchronizes frame alignment signal bytes in each of the second plurality of data streams to the frame alignment signal bytes in the first data stream.

21. The system of claim 16 wherein each of the second plurality of processors supplies a processed data stream message in a frame format with overhead bytes; and,

wherein the multiplexer transmits the first processed data stream messages in a frame format with overhead bytes.

22. The system of claim 21 wherein each processor has an output to supply a frame start signal corresponding to its processed data stream; and,

wherein the multiplexer has an input to receive the frame start signals and multiplexes each of the second plurality of processed data streams into the first processed data stream in response to the second plurality of received frame start signals.

23. The system of claim 22 wherein the multiplexer synchronizes overhead bytes in the first processed data stream to the overhead bytes in the second plurality of processed data streams using the frame start signals.

24. The system of claim 23 wherein the second plurality of processors supply frame alignment signal bytes in the overhead of every frame in the second plurality of processed data streams; and,

wherein the multiplexer synchronizes frame alignment signal bytes in the first processed data stream to each of the frame alignment signal bytes in the second plurality of processed data streams.

25. The system of claim 24 wherein the multiplexer compares each of the second plurality of received frame start signals, phase matches the frame start signals, deskews the second plurality of processed data streams to match their corresponding frame start signals, and multiplexes the deskewed second plurality of processed data streams.

26. The system of 16 wherein the second plurality is equal to four.

27. The system of claim 16 wherein the first data rate is approximately 40-gigabits per second (Gbs) and the second data rate is approximately 10-gigabits per second.

28. In a G.709 network of connected integrated circuits, a system for paralleling data streams, the system comprising:

a second plurality of processors, each processor having an output to supply a processed digital wrapper data stream at the second data rate; and,

a multiplexer having an input to receive the second plurality of processed data streams, the multiplexer multiplexing the second plurality of data streams into a first digital wrapper processed data

stream having the first data rate, greater than the second rate, supplied at an output for transmission.